

## REMARKS

Applicant respectfully requests reconsideration of the present U.S. patent application. Claim 26 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. Claims 1-25 and 27-35 stand rejected under 35 U.S.C. § 102. Claims 1, 13, 15, 19, 24 and 28 have been amended. Claim 29 has been canceled. No claims have been added. Therefore, claims 1-28 and 30-35 are pending.

### Claim Rejections - 35 U.S.C. § 102

#### Rejections of Claims 1-14, 19, 24, 25 and 27-35 based on *Barrou*

Claims 1-14, 19, 24, 25 and 27-35 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,912,478 issued to Barrou et al. (*Barrou*). Claim 29 has been canceled. Therefore, the rejection of claim 29 as being anticipated by *Barrou* is moot. For at least the reasons set forth below, Applicant asserts that claims 1-14, 19, 24, 25, 27, 28 and 30-35 are not anticipated by *Barrou*.

Amended claim 1 recites the following:

a charge layer ... formed of substantially the same material as a first multiplication layer disposed adjacent said charge layer ...

Amended claims 19 and 28 recite similar limitations.

*Barrou* discloses an avalanche photodiode having certain layers deposited in succession on a substrate. See Fig. 4, col. 4, lines 10-14. Included in the stack is a multiplication zone containing a layer of multiple quantum wells constituting alternating layers of AlInAs and GaAlInAs. See Fig. 4, col. 4, lines 19-20 and 46-47. Further up the

stack there is a transition zone, which includes a layer defining the doping plane of the transition zone, the layer comprising  $(\text{InAlAs})_{0.1}(\text{InGaAs})_{0.9}$ . See Fig. 4, col. 4, lines 33-34 and 49-51.

According to the Examiner, the layer of multiple quantum wells and the layer defining the doping plane of the transition zone in *Barrou* are the multiplication region and charge layer of claims 1, 15, 19 and 28, respectively. See Office Action, page 3, lines 6-7 and page 4, lines 2-8, page 4, line 20 – page 6, line 16. Applicant does not agree with Examiner regarding whether the above-referenced layers in *Barrou* correspond to the above-referenced layers in claims 1, 19 and 28. However, under the Examiner's interpretation of *Barrou*, the multiplication region would include layers of  $\text{AlInAs}$  and  $\text{GaAlInAs}$ , while the charge layer would include  $(\text{InAlAs})_{0.1}(\text{InGaAs})_{0.9}$ . The multiplication region and the charge layer would be formed of different materials.

Consequently, *Barrou* does not disclose a charge layer formed of substantially the same material as a first multiplication layer disposed adjacent said charge layer. Thus, *Barrou* fails to disclose at least one limitation of claims 1, 19 and 28. As a result, claims 1, 19 and 28 are not anticipated by *Barrou* for at least the reasons set forth above. Applicant therefore respectfully requests that the Examiner withdraw the rejections of claims 1, 19 and 28 under 35 U.S.C. § 102.

Claims 2-14 depend from claim 1. Claims 24, 25 and 27 depend from claim 19. Claims 30-35 depend from claim 28. Because dependent claims include the limitations of the claims from which they depend, Applicant submits that claims 2-14, 24, 25, 27 and 30-35 are not anticipated by *Barrou* for at least the reasons set forth above.

Rejections of Claims 15-23 based on *Kuhara*

Claims 15-23 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 6,218,684 issued to Kuhara et al. (*Kuhara*). For at least the reasons set forth below, Applicant asserts that claims 15-23 are not anticipated by *Kuhara*.

Amended claim 15 recites the following:

said charge layer is formed of substantially the same material as a first multiplication layer disposed adjacent said charge layer.

*Kuhara* discloses a half-transmittance photodiode comprising an InP substrate having grown thereon an InP buffer layer, an InGaAsP absorption layer and an InP window layer. See col. 16, lines 27-37. *Kuhara* does not disclose a charge layer formed of substantially the same material as a first multiplication layer disposed adjacent said charge layer. Thus, *Kuhara* fails to disclose at least one limitation of claim 15. As a result, claim 15 is not anticipated by *Kuhara* for at least the reasons set forth above. Applicant therefore respectfully requests that the Examiner withdraw the rejections of claim 15 under 35 U.S.C. § 102.

Claims 16-23 depend from claim 15. Because dependent claims include the limitations of the claims from which they depend, Applicant submits that claims 16-23 are not anticipated by *Kuhara* for at least the reasons set forth above.

Allowable Subject Matter

Claim 26 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 26 depends from claim 19, which, as

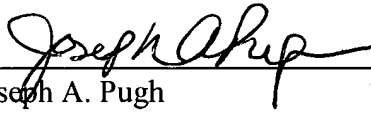
explained above, is not anticipated by *Barrou* or *Kuhara*. Therefore, Applicant submits that claim 26 is in condition for allowance because claim 19 is in condition for allowance. Consequently, Applicant has not rewritten claim 26 in independent form.

#### CONCLUSION

Applicants submit that claims 1-28 and 30-35 are in condition for allowance and such action is respectfully solicited. The Examiner is respectfully requested to contact the undersigned by telephone if such contact would further the examination of the present application.

Respectfully submitted,

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